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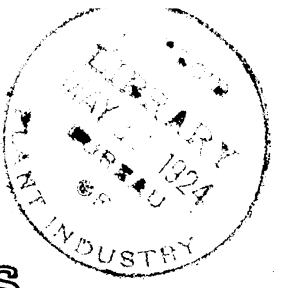

PLANT IMMIGRANTS

No. 214 February, 1924

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NOTES AND COMMENTS

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Plate 347. Chayote culture in Costa Rica (*Chayota edulis*).

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United States Department of Agriculture
BUREAU OF PLANT INDUSTRY
OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION

EXPLANATORY NOTE

PLANT IMMIGRANTS is designed principally to call the attention of plant breeders and experimenters to the arrival of interesting plant material. It should not be viewed as an announcement of plants available for distribution, since most introductions have to be propagated before they can be sent to experimenters. This requires from one to three years, depending upon the nature of the plant and the quantity of live material received. As rapidly as stocks are available, the plants described in this circular will be included in the Annual List of Plant Introductions, which is sent to experimenters in late autumn. Introductions made for a special purpose (as for example to supply Department and other specialists with material needed in their experiments) are not propagated by this Office and will not appear in the Annual List.

Descriptions appearing here are revised and later published in the Inventory of Seeds and Plants Imported, -the permanent record of plant introductions made by this Office.

DAVID FAIRCHILD
Agricultural Explorer in Charge,
Office of Foreign Seed and Plant Introduction.

Issued May 12, 1924, Washington, D. C.

Plants recently received, not yet available for distribution.

ANEMONE spp. (Ranunculaceae), 58393, 58359. From Yunnan, China. Seeds collected by J. F. Rock, Collaborator of the Bureau of Plant Industry. Quoted notes by Mr. Rock.

58393. ANEMONE DEMISSA. "(Saba. September, 1923.) A lovely alpine plant common in limestone soil on all of the mountain meadows of the Likiang Snow Range at altitudes of 11,000 to 13,000 feet and higher. The leaves are in basal rosettes, and the large white flowers are in many-flowered umbels."

58359. ANEMONE sp. "(October 8, 1923.) A plant about 3 feet high, which grows in moist alpine meadows at the edge of fir forests on the Litiping-Yangtze-Mekong Watershed at an altitude of about 11,000 feet. The large, dark-green, glossy leaves form globose cushions, and the umbels of white flowers are on stalks 3 feet or more in length."

CEPHALOTAXUS sp. (Taxaceae), 58360. From Yunnan, China. Seeds collected by J. F. Rock, Collaborator of the Bureau of Plant Industry. "(No. 10891. October 7, 1923.) A small coniferous tree, 20 to 25 feet tall, growing in dense clumps above Lutien on the eastern slopes of the Yangtze-Mekong Watershed at an altitude of 9,600 feet. The rather long, broad needles are bluish green, and the maroon-colored fleshy fruits, the size of small plums, contain almond-shaped, thin-shelled stones." (Rock.)

CUCUMIS sp. (Cucurbitaceae), 58406. From Manila, Philippine Islands. Seeds presented by P. J. Wester, Bureau of Agriculture. "'Kondol-nak.' I collected these seeds on a recent trip to Tanjay, Island of Negros. The fruits are like miniature watermelons in shape and color, averaging 5 cm. (2 inches) in length. The flesh is edible, though of little value, but the plant might be serviceable for plant breeders who are working to get wilt-resistant cucumbers and watermelons. The fruits remain in good condition on the vines for some weeks, and so may be of ornamental value in Florida." (Wester.)

EUCALYPTUS DELEGATENSIS (Myrtaceae), 58127. From Hobart, Tasmania. Seeds presented by L. A. Evans, Secretary of Agriculture, Agricultural and Stock Department.

This tree, originally described by Hooker under the name of *Eucalyptus gigantea,* was renamed by R. T. Baker in 1900. L. Rodway, in his paper on Tasmanian Eucalypts (Royal Society of Tasmania, Papers and Proceedings, 1917) remarks that it assumes large dimensions. It is described as erect, the branches usually short and ascending, the bark thin-fibrous, and the foliage very similar to that of *E. obliqua.*

Mr. Evans, who sends these seeds, states that they were grown at Tyenna, which has an altitude of over 700 feet, and a rainfall of more than 40 inches per annum.

E. delegatensis merits testing, on a limited scale, in Florida, the lower South, and the Southwest, to see if it exhibits valuable characteristics not shown by other species already grown in this country.

INCARVILLEA GRANDIFLORA BREVIPES (Bignoniaceae), 58395. From Yunnan, China. Seeds collected by J. F. Rock, Collaborator of the Bureau of Plant Industry. "(No. 8991. Saba. September, 1923.) A stemless plant found in limestone soil on all of the mountain meadows of the Likiang Snow Range at altitudes of 9,500 to 12,000 feet, where it is the first to flower in early spring. The dark-green glossy leaves are lyrate and pinnately cut, and the large flowers, 2 to 3 inches across, are deep magenta purple with yellow throats."

IRIS sp. (Iridaceae), 58361. From Yunnan, China. Seeds collected by J. F. Rock, Collaborator of the Bureau of Plant Industry. "(October 8, 1923.) A plant a foot to a foot and a half in height, growing in clumps in the moist alpine meadows of Litiping, north of Lutien, at an altitude of about 11,000 feet. It is very handsome, with deep indigo-blue flowers." (Rock.)

MECONOPSIS spp. (Papaveraceae), 58425, 58396. From Yunnan, China. Seeds collected by J. F. Rock, Collaborator of the Bureau of Plant Industry. Quoted notes by Mr. Rock.

58425. MECONOPSIS DELAVAYI. "(No. 9377. September, 1923.) This is one of the prettiest blue poppies of the Likiang Snow Range, where it grows in moist meadows and on gravelly slopes at altitudes of 11,000 to 12,500 feet, usually in small groups of twenty or more. The plants are 6 to 10 inches in height, with large, drooping, purplish indigo-blue flowers."

58396. MECONOPSIS RUDIS "(No. 9840. September, 1923.) A plant 1 or 2 feet tall which thrives in loose limestone gravel, in company with *Meconopsis integrifolia,* on the Likiang Snow Range at an altitude of about 13,000 feet."

PERSEA AMERICANA (Lauraceae), 58365. **Avocado.** From San Jose, Costa Rica. Seeds presented by Oton Jimenez. "Wild relatives of cultivated fruits are always interesting, not only as serving in some instances to complete the story of descent from wild to cultivated forms, but also as stock plants on which to graft the latter, or to infuse, when crossed with them, new and vigorous blood often needed by decadent cultivated varieties.

"During the investigations carried out in tropical America by the Office of Foreign Seed and Plant Introduction, with a view to securing new and promising varieties of the avocado for trial in the United States, a secondary object was constantly borne in mind,- the discovery of wild avocados.

"It has long been known that the small-fruited Mexican avocado, botanically classified as variety *drymifolia* of the common avocado, *Persea americana,* occurs abundantly as a wild tree upon the lower slopes of the Volcano Orizaba in Mexico. In all probability it is indigenous in that region. This form is not, however, of much value horticulturally, and it does not seem to represent the wild prototype of the cultivated West Indian and Guatemalan varieties.

"In 1920, Oton Jimenez and I discovered, upon the slopes of the Volcano Irazu in central Costa Rica, a wild avocado which bears much greater resemblance to the large-fruited forms of horticulture. It may be that this is the true prototype or wild ancestor of some of these forms.

"This avocado, known locally as 'aguacate de anis,' occurs on hillsides and along ravines at elevations between 4,500 and 5,000 feet. While we have seen it only in the vicinity of La Palma, it doubtless occurs in other parts of central Costa Rica. The fruiting habit of the tree suggests the Guatemalan race of horticulture, as also the hard, granular shell of the fruit itself. In the posession of a strong anise-like odor in the leaves, bark, and fruit, however, this wild form differs from all cultivated varieties of the Guatemalan race, as well as the West Indian.

"The tree grows to about 40 feet in height, and is erect, almost slender in habit. The leaves are thicker and stiffer than is common in cultivated avocados, glabrous on the upper surface and sparsely puberulent below. The fruits, so far as has been observed, are borne singly on stout fruitstalks 4 inches or more in length. They are roundish oblate in form, and 2 to 3 inches in diameter. The surface is moss-green, pebbled or slightly rough; the skin or shell is about one-tenth of an inch thick, very coarsely granular in texture, hard and woody. The flesh is pale yellow changing to greenish toward the shell. There are no fibers through the flesh, but there are numerous small, hard bodies like the stone cells of Chinese pears. These give the flesh a gritty feeling in the mouth. The flavor is strong, suggesting anise, at the same time rich and nutty, as in the cultivated avocados. The seed is very large, oblate in form, with both seed coats adhering closely to the cotyledons.

"The flowering season in the Costa Rican highlands is in March and April, and the fruits ripen a year from the following May or June, after having been on the tree 12 to 15 months.

"At the time this species was discovered in 1920, it was possible

to secure only a few fruits, and the budwood sent to Washington failed to survive. Consequently, it has not yet been possible to give this form a thorough test in the United States as a stock plant for cultivated avocados. Through the efforts of Oton Jimenez, who has devoted much time to the search for a more abundant source of supply, numerous trees have been located and several hundred fruits secured from this season's crop. It is proposed to utilize some of these as stock plants, so as to test their value for this purpose, while others will be planted in California and Florida with the object of establishing a future seed supply in the United States." (Wilson Popenoe.)

PRIMULA spp. (Primulaceae), 58398, 58426, 58399, 58368, 58400, 58401, 58402, 58405. **Primrose.** From Yunnan, China. Seeds collected by J. F. Rock, Collaborator of the Bureau of Plant Industry. Quoted notes by Mr. Rock.

58398. PRIMULA BULLEYANA. "(No. 8988. Heshwe. September, 1923.) A very striking species 2 to 3 feet high, found only in boggy meadows at Heshwe, on the eastern slope of the Likiang Snow Range, at an altitude of about 11,000 feet. The deep, reddish orange flowers, brownish crimson in bud, are slightly fragrant."

58426. PRIMULA DRYADIFOLIA. "(No. 9862. September, 1923.) A very handsome, rather uncommon primrose which forms cushions in moist rocky places on the eastern slopes of the Likiang Snow Range at an altitude of 15,000 feet. The plant is only 4 or 5 inches high, with spatulate leaves, golden below, and large, rich-crimson, purple-tinged flowers which appear from June to August."

58399. PRIMULA POISSONI. "(September, 1923.) One of the hardiest primroses from this region; it is confined to swampy meadows or even to the gravelly beds of shallow brooks on the Likiang Snow Range at altitudes of 8,000 to 10,000 feet. The flowers, with crimson-lake corollas and yellow throats, are in candelabralike spikes."

58368. PRIMULA PSEUDOSIKKIMENSIS. "(No. 8995. September, 1923.) This primrose, which is 1 or 2 feet high, with the habit of *Primula secundiflora*, grows in moist meadows and along stream beds on the Likiang Snow Range at an altitude of 13,000 feet. The lanceolate drooping leaves are dull green on both sides, and the rich-yellow flowers, which appear in June, are large and bell-shaped."

58400. PRIMULA PULCHELLA. "(No. 8682. Saba. September, 1923.) A handsome primrose growing in limestone soil in rather moist meadows on the eastern slopes of the Likiang Snow Range, at an altitude of 11,000 feet. The lanceolate leaves are yellowish beneath, and the large flowers are bluish purple."

58401. PRIMULA SINOPURPUREA. "(September, 1923.) A very ornamental species about 2 feet in height, found in moist meadows on the western slopes of the Likiang Snow Range at an altitude of 13,000

feet or more. The linear leaves are bright green above and golden yellow beneath, and the purplish red flowers are borne in dense umbels. The flowers appear in May and June, and the fruits in early September."

58402. PRIMULA VINCIFLORA. "(No. 8394. September, 1923.) A plant about 15 inches high, which loves moist meadows and shady situations on the edges of fir and spruce forests on the eastern slopes of the Likiang Snow Range at an altitude of about 12,000 feet. The leaves are elliptical and dull green, and the large flowers, resembling those of Vinca, are a deep indigo blue."

58405. PRIMULA sp. "(No. 9617. September, 1923.) One of the earliest primroses of this vicinity, flowering in February on dry grassy slopes of the Likiang Snow Range at altitudes of 7,000 to 11,000 feet. It is likewise distributed from the Tengyueh Mountains to north of Likiang and beyond the Yangtze on Haba Shan. The flowers, in dense globose heads, are deep blue with a slight purplish tinge."

TROLLIUS sp. (Ranunculaceae), 58427. From Yunnan, China. Seeds collected by J. F. Rock, Collaborator of the Bureau of Plant Industry. "(No. 9651. September, 1923.) A very showy plant about 2 feet high which grows in moist alpine meadows on the eastern slopes of the Likiang Snow Range at altitudes of about 12,000 feet, also on Haba Shan, north of the Yangtze bend. The leaves are basal, and each plant bears about ten large, deep golden-yellow flowers 2 inches or more in width." (Rock.)

Notes on Behavior of Previous Introductions.

AMYGDALUS PERSICA (Amygdalaceae), 33219. **Peach.** Var. "Vainqueur." From Granada, Spain. "This has now fruited here for two seasons, and I like it very much. It grows well, is hardy here, and ripens one week after Mayflower and about a week before Greensboro, and in quality is as good or better than the latter. It fills in the period between these two varieties for my local trade." (Nat. E. Booth, Southold, Long Island, N. Y., March 12, 1924.)

BRASSICA PEKINENSIS (Brassicaceae), 45969. **Pai ts'ai.** From Peking, China. "We have grown this strain for two years, and not one plant has failed to make a head. The heads weigh from 3 to 6 pounds each, and are somewhat darker green than the common pai ts'ai. A remarkable thing about this strain is that it heads in weather during which cauliflower, head lettuce, and all other strains of pai ts'ai fail to develop a marketable product." (A. F. Yeager, Agricultural College, N. Dak., February 26, 1924.)

CHIONANTHUS RETUSA (Oleaceae), 21617. **Chinese Fringe Tree.** From Shantung, China. "A plant of this was received in 1910 and was planted

in Takoma Park, D. C. It is now a small tree of attractive proportions and has blossomed for 6 or 7 years. Its single stem is 16 inches in circumference at the base, the tree is 16 feet high with a spread of 11 feet, and the last year's growth is about 12 inches long. The wood is stiff and splits off easily.

"As compared with the native Virginia Fringe tree (*Chionanthus virginica*), it excels it in several characters: (1) It grows quite naturally into a single-stemmed tree, rather than a many-stemmed bush, as often happens with our Fringe tree. It reaches a size somewhat larger than our Flowering dogwood, and grows more rapidly while young. (2) Its leaves are smaller than those of our native form, and give the tree a more open and graceful aspect. (3) Its flowers are carried with more grace than our species; the clusters are smaller and more erect. (4) The color of the flowers is pure white, while ours are often tinged with green. (5) Furthermore, the flowers have an attractive fragrance which the Virginia Fringe tree lacks. The flowers open in mid-May, coming with well-developed foliage, while the flowers of our species are largely on bare twigs.

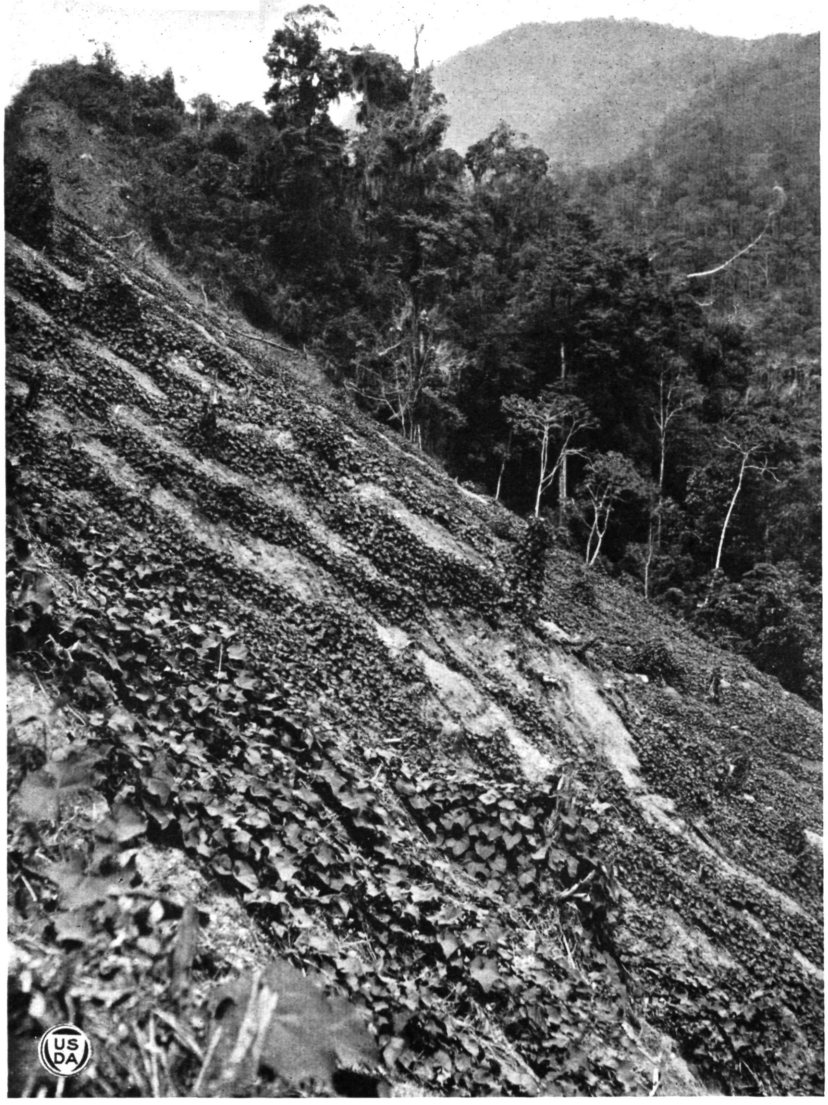
"This species is reported to be practically dioecious but it has regularly matured fruits, which are purple, olive-shaped drupes about half an inch long. Various birds are very fond of the flesh of these." (D. N. Shoemaker, Takoma Park, D. C., April 4, 1924.)

KOLKWITZIA AMABILIS (Caprifoliaceae), 38832. From Shensi, China. "It is to be regretted that the first half of the binomial of this excellent shrub is not as lovely as the latter half. It will undoubtedly become popular however in spite of its harsh and outlandish name. We have become accustomed to the names 'Tolstoi' and 'Kosciusko,' so why not 'Kolkwitzia'?

"My specimen was secured in 1917, and is now at seven years of age a bush 7 feet high, with a spread of 8 feet. It resembles the bush honeysuckles in growth, but has larger flowers, which are produced with great profusion, and completely cover the plant. They open about the middle of May, coming after the leaves are well started. The flower is fairly clear white, tinged with pink on the outside, narrowly tubular at the base expanding into a wider tube, and crowned with five rounded spreading lobes. After the flowers have fallen the fruits form an interesting feature of the shrub. They are dry capsules covered by conspicuous brownish hairs.

"It does not offer many offsets at the base for propagation, but grows readily from well-ripened green-wood cuttings taken in summer. The older stems shed their bark in characteristic flakes which usually cling to the stem by one side but become loosened for half the way round.

"Kolkwitzia is in appearance a bush honeysuckle with flowers the



CHAYOTE CULTURE IN COSTA RICA.

(*Chayota edulis* Jacq.)

In Mexico and Guatemala, as well as in the United States, the chayote is usually grown on arbors or trellises. In Costa Rica, however, it is sometimes planted on hillsides and cultivated in the same manner as the cucumber and the squash. Where the soil is sandy and drainage good, this method seems to be successful. The field here shown is near Juan Vinas, Costa Rica, on the slopes above the Rio Reventazon. (Photographed by Wilson Popenoe, June 5, 1920; P17876FS.)

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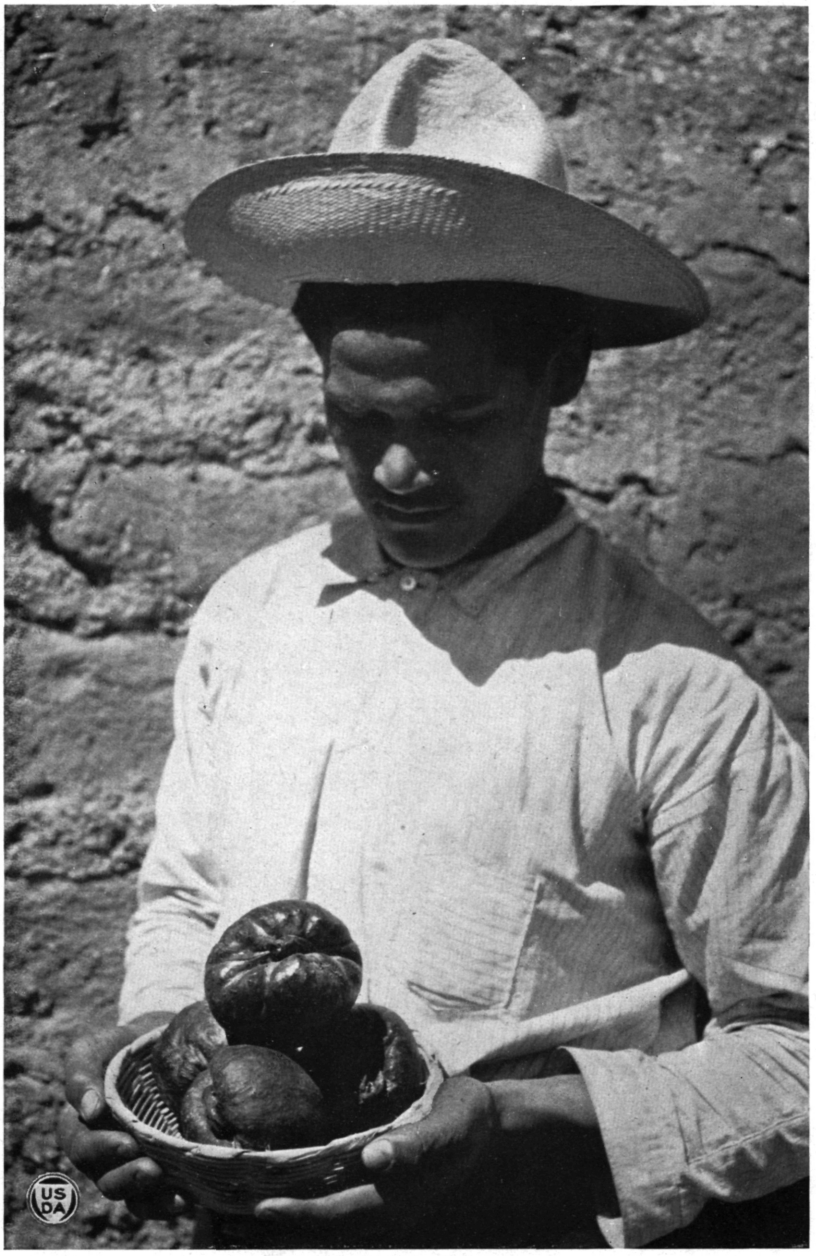
Pl. 348



THE FAVORITE CHAYOTE OF THE GUATEMALANS.

(*Chayota edulis* Jacq.)

It is only in recent years that the study of chayote varieties has received attention in the United States. The introduction of many forms from Mexico and Central America and their trial in Florida has brought to light the fact that they differ greatly in quality and value. The one here shown, a round, smooth, dark-green chayote from the mountains of Guatemala, is a favorite sort in that country, where it is considered of richer flavor than others. It is now being grown in the southeastern United States. (Photographed by Wilson Popenoe at Antigua, Guatemala, February 26, 1920; P17751FS.)

GOVERNMENT PRINTING OFFICE

size of those of Weigelia, but more attractive in color and with the added value of interesting fruits." (D. N. Shoemaker, Takoma Park, D. C., April 4, 1924.)

The Pacayito.

Ten years ago, when conducting field work in northern Guatemala, O. F. Cook of the Department of Agriculture was impressed by the beauty of a dwarf palm which he encountered at Senahu, in the department of Alta Verapaz. He sent nine grams of seeds to Washington. S. P. I. No. 38515 was assigned to the lot, and, for lack of a complete botanical determination, the species was listed simply as a Chamaedorea. Mr. Cook said that its native name in the Senahu region was *Canquib.* Later the botanical determination was considered incorrect, and the plant was catalogued as *Nunnezharia* sp.

From the seed secured by Mr. Cook, a few plants were grown at the Yarrow Plant Introduction Garden, Rockville, Maryland. In 1915, seven of these were sent to experimenters in Florida, the Canal Zone, Missouri, Nevada, and Maryland. Nothing was heard of them, and the pacayito dropped out of sight for the time being, though Mr. Cook had a few plants at his home in Lanham, Maryland, where he was carefully watching their behavior and informing himself regarding their cultural requirements.

Three years after this first introduction, I spent several months in northern Guatemala, where I went primarily to search for choice avocados. Like Mr. Cook, I was struck by the beauty of the pacayito in the forests of that region, and I determined to effect its introduction into the United States on a scale which would permit of its being tested widely. I commenced a search for seeds, but was surprised to find it impossible to secure more than a very small number of them. Though the plants flowered annually, and set abundant fruits, it appeared that the latter were eaten by insects before they reached maturity, in the great majority of cases. After spending some time in the search, and securing only 125 seeds, I decided to send live plants in place of seeds. With this object in view, I visited the mountains near Purula, department of Baja Verapaz, and with the aid of my Indian assistant, Jose Cabnal, located a spot where this palm occurred abundantly. I dug several hundred fine young specimens out of the leaf-mold in which they grew, packed them in bundles of twenty-five, wrapped each bundle in moss which I found growing in the same region, and hurried them down to the coast. The shipment reached Washington promptly, and most of the plants were saved. From this lot, and the seeds which were secured at the same time, a good stock of plants became available, and were distributed widely. Following is the Inventory note which accompanied this material:

S. P. I. No. 44994. *Chamaedorea* sp. A dwarf palm collected in dense forests near Purula, department of Baja Verapaz, at an elevation of approximately 5,500 feet.

This species is usually called by Spanish-speaking Guatemalans *pacayito,* which means 'small pacaya.' By the Indians of the Alta Verapaz, who speak the Kekchi language, it is called *ko-kiip.*

Judging from accounts given me by various residents of the Verapaz, this palm commonly occurs in the mountains of that region at elevations of about 4,000 to 6,000 feet. It always grows in dense forests, and must be considered a shade- and moisture-loving species. The soil in which it grows is nothing but decayed leaves for the first several inches, and is kept continually moist by the abundant rains of this region. In Coban the pacayito is a favorite house plant, being grown in pots and tubs and used to decorate living rooms and patios. In the city of Guatemala it is occasionally used for the same purpose, the plants being brought down from Coban.

In the forest, the pacayito seems never to reach a greater height than three feet. It is a true dwarf (one might also call it a miniature palm), for it reaches maturity and comes into flower when not over a foot high. This dwarf habit makes it of unusual interest as a pot plant for the north, as it can be fruited in an ordinary living room when growing in a four-inch pot.

It makes its character leaves almost as soon as the young plant is out of the seed. I have seen many plants in the forest which were not over 4 inches high, and already had two to four fully characterized leaves. When quite small it strongly resembles *Cocos weddelliana,* but the pinnae are somewhat broader and not so numerous.

When mature, the plant has a slender trunk, perhaps half an inch thick and two feet high. The leaves are a foot to eighteen inches in length, rather finely pinnate, deep green, graceful, with the rachis stiff but arching slightly. In the Verapaz the flowers are produced in June and July, and the small, round, black fruits about as large as small peas, ripen in December.

Since it is found at considerable elevations in the Verapaz, it seems likely that this palm will be sufficiently hardy for cultivation in the open in California and Florida. It should be provided with ample

> shade, however, and planted in a very moist situation in soil containing a large proportion of leaf mold. As a house plant for the northern states, and for use in fern dishes, it seems to me that this plant possesses unusual possibilities, and I strongly recommend it for trial.

A year later, I found this same palm growing near Pochutla, in the state of Oaxaca, Mexico, and sent in a few seeds, to which were assigned S.P.I. No. 46783. In 1920, I was again in northern Guatemala. Being convinced by this time that the pacayito was adapted to house culture in the United States, and having been requested by the Office to secure a large number of plants, so that the species could be given even wider distribution than had yet been possible, I spent several days at the finca Mocca, where, through the courtesy of Robert W. Hempstead, and the aid of my Indian assistant, Victor Chiquin, I brought together a shipment of nearly two thousand fine young plants, together with seven ounces of seeds. This shipment was escorted to the coast, and dispatched from Puerto Barrios to New Orleans. It reached Washington in good condition, and most of the plants were saved. They were grown for a year or more at the Plant Introduction Garden, Bell, Maryland, and then distributed widely, to experimenters in Florida and California who desired to test them out-of-doors, and to people in the North who wished to try them as pot plants for house culture.

At this writing, ten years after the first introduction of the species, it has shown its value in the United States to the extent that two nursery firms are attempting to secure by importation from Guatemala large quantities of seeds or young plants. For open air culture in California and Florida it has not proved satisfactory; but as a subject for house culture in the North it is excellent. It should be remarked, however, that its cultural requirements are not yet fully understood. In sending it from Guatemala, I stated that it should be grown under shade, and provided with ample moisture. Later I observed that it grew on limestone soils, or in regions where such soils predominated. In the United States, we have found that ordinary living room temperatures are quite favorable to its development, but the atmospheric aridity which frequently prevails during the winter months is apt to prove inimical. It does not require continuous shade, but tolerates it to a much greater degree than many other plants.

Not until recently has the species been carried on our records under a specific name. A flowering specimen from the greenhouse at Bell, Maryland, was sent to Professor Guillaumin at the Museum d'Histoire Naturelle, in Paris, France, and shortly afterwards we received word that it had been identified as *Chamaedorea elegans* Martius. In his article on "Les Chamaedoreas Cultives," published in the Journal de la Societe Nationale d'Horticulture de France (June, 1918), Prof. Guillaumin

states that this species was introduced into Europe by Linden in 1839, and it has been cultivated at the Museum in Paris since that time. He adds that Hooker attributes its introduction to Schiede and Deppe. Its native home is held to be in the states of Vera Cruz and Oaxaca, Mexico, and possibly also in Guatemala. Apparently it has received very little attention at the hands of European horticulturists.

Wilson Popenoe

Prunus Mume

As an ornamental plant for mild-wintered regions of the eastern United States, *Prunus mume* has received attention from this office since 1903, when the first introduction was made. In 1922, a splendid collection of the best Japanese varieties was secured from Prof. T. Onda, of Okitsu. These were described in Plant Immigrants for April of that year, under S.P.I. Nos. 54709 to 54725, inclusive, and budded trees of several varieties, propagated from the original introductions, have been distributed during the past season. Because of its being one of the first trees to blossom in the spring, and because of the fragrance of its flowers as well as their beauty of form and color, *Prunus mume* deserves to be cultivated widely as an ornamental.

The Plant Introduction Garden at Chico possesses a number of trees, which have been flowering and fruiting for several years. At Washington the tree rarely bears fruit, though it flowers profusely. The Japanese prepare from mumes an extremely salty pickle, which is highly appreciated. It is popularly said, in fact, that the Russo-Japanese war was won by this product. It was an important item in the rations issued to Japanese soldiers, and, as evidenced by this popular saying, one of the most esteemed.

National differences in taste preclude the likelihood that pickled mumes will become as popular in the United States as they are in Japan. The mume may have other uses in this country, however, as evidenced by the following extract from a letter received from J. E. Morrow, superintendent of the Chico Plant Introduction Garden, dated April 4, 1924:

"The pectin content of *Prunus mume* is remarkable, indeed. It seems to me that with a half dozen fruits one could jelly a bucket of water. Last summer we called the attention of the office to this remarkable quality of the fruit. In addition to this, we would say that it is extremely frost resistant. These trees are the first at the garden to flower each spring, and they set a heavy crop of fruit regardless of frost or minimum temperatures. In looking over the test nursery this morning, I found the trees of *Prunus mume* heavily laden with fruit, while apricot trees near by were without a single fruit, and other introduct-

ions, including almonds, had their crops either killed entirely or very badly cut down. We also found that *Prunus mume* is apparently quite resistant to crown gall, seemingly wholly resistant to oak-root fungus, and last and most important of all, it appears to be resistant or entirely immune from the attacks of nematodes. The flowers of some varieties are quite attractive and very fragrant. We believe it possesses real value for stock purposes. However, it will be necessary to make a selection from the more vigorous types, as some of them would likely tend to dwarf the scions."

The Pejibaye

During the past three years, this office has received more than 25,000 seeds of the pejibaye palm (*Guilielma utilis* Oerst.) from Costa Rica. No plants were grown from the first shipments, the seeds having lost their viability before they reached Washington. Finally, through the courtesy of the United Fruit Company, a box of pejibaye fruits was sent from Port Limon. It was thought the seeds might carry better in this fashion than when cleaned and dried. On reaching New York, it was found that the fruits had fermented and were decidedly unsavory to smell and handle. Consequently, they were thrown into the bay by stevedores who assumed that they had been intended for eating, and that it was useless to forward them to their destination. A second shipment dispatched in the same fashion, with the addition of instructions to let them proceed to Washington, reached our hands, and nearly a thousand fine young plants have been grown from it. These are now in the greenhouses at Bell, Maryland.

The pejibaye has been described in Plant Immigrants (see No. 191, March, 1922, pp. 1734-35) and more fully in the Journal of Heredity for April, 1921. It is a tropical palm of ornamental appearance, which produces large racemes of top-shaped fruits, each the size of an apricot, bright orange-yellow in color, and having a single bony seed surrounded by a quantity of mealy pulp. This latter, when boiled, has the flavor and consistency of roasted chestnuts and is an excellent food. At the time of the Conquest, the Indians of Costa Rica subsisted almost exclusively upon pejibayes during a certain part of each year. The fruit has become a very popular article of diet among Costa Ricans of European blood, and fetches a high price in the markets of the capital. Farther south, in Colombia, Venezuela and Ecuador, this palm or one very closely allied to it, is cultivated by many Indian tribes, and highly esteemed by them as an article of food. The renowned peach palm of the Amazon may also be this same species, though it is usually catalogued as *Guilielma speciosa.*

This office has sent seeds of the pejibaye to many tropical countries where the species is not yet known. It is feared, however, that they have failed to germinate in many instances, since they seem particularly difficult to transport long distances. We feel confident that the pejibaye will prove an acquisition of great value in the West Indies, in Hawaii, and in the Philippines. Upon application, plants will be sent to experimenters of this Office in those regions, and we will be glad, also, to supply our correspondents and collaborators in other tropical countries. We particularly suggest the desirability of testing this palm in central and northern India, in Egypt, in parts of the Malayan region and on the islands of the Pacific. From observations in Costa Rica, we do not feel certain that it will prove highly successful in extremely moist tropical regions of low elevation.

Wilson Popenoe.

FOREIGN SEED AND PLANT INTRODUCTION

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